

ABSTRACT

CORRELATION BETWEEN HEARING THRESHOLD VALUE  
FREQUENCY OF 4000 HZ WITH HEAT SHOCK PROTEIN 70 (HSP 70)  
SERUM LEVELS AFTER GUNSHOT EXPOSURE ON EAST JAVA STATE  
POLICE SCHOOL STUDENTS

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**Objective :** Gunshot exposure on shooters cause hearing loss due to hair cell (HC) damage in cochlea that indicated by acoustic trauma. Acoustic trauma is a sensorineural hearing loss (SNHL) characterized by a notch or an increase of hearing threshold frequency of 4000 Hz. Routine pure-tone audiometry (ANM) for shooters cannot predict the risk of hearing loss, patients with average audiometry have had a hearing loss. At present there are no parameters that can be used by shooters to be able to start shooting practice after resting after exposure to exposure to gunfire. HSP 70 increased significantly in patients exposed to exposure to gunfire. If exposure to firearm eruptions is stopped, serum HSP 70 levels will also gradually decrease, so that it can be used to predict the prognosis of hearing loss due to exposure to firearm eruptions.

**Methods :** Design of the study is retrospective cross sectional. Research was conducted at East Java State Police School. Research was held in August to November 2018. It obtained 50 samples who participate freely for audiometry examination and HSP 70 serum levels measurement. Hearing thresholds was measured using audiometer Interacoustics Type AD226. The HSP 70 serum levels were measured by ELISA method using human HSP 70 ELISA kit reagen of Elabscience. Data were arranged as a scale ratio and analyze using Pearson correlation.

**Result :** The youngest participant of the study is 18 years old and the oldest one is 21 years old. They does not complain of tinnitus nor vertigo. Hearing loss was complained by 1 studens (2%). Acustic trauma of this research was found in 28 studens (56%). Statistic test using pearson correlation found coefficient correlation ( $r$ ) = 0,45 and  $p$  = 0,001 ( $p < 0,05$ ). It indicated that HSP 70 serum levels and hearing threshold at 4000 Hz frequency have a moderate positive correlation and significant.

**Conclusion** there was a moderate correlation between HSP 70 levels and hearing threshold value at 4000 Hz frequency after gunshot exposure on East Java State Police School Studens

**Keywords :** Acoustic trauma, Heat shock protein 70 (HSP 70), hearing threshold value level at frequency 4000 Hz.